

chips arrayed on the wafer surface. It is to be noted that since chip ID information is provided in the two-dimensional barcode pattern, it becomes possible to make use of chip information that is inherent to each chip.

Since the quantity of information that can be recorded per unit area of a two-dimensional code pattern is very large and recognition utilizing an optical apparatus can be implemented with ease, marking can be made on each of the chips arrayed on the wafer surface, which has not been possible in the prior art, so the information management can be easily implemented for chips on an individual basis.

In addition, as a method for marking a two-dimensional barcode pattern on each chip, projection and exposure may be implemented by employing a liquid crystal mask capable of changing transmitted patterns for different exposures to provide different chip ID information for each wafer using the same mask.

In order to achieve the objects described above, in a second aspect of the present invention, a semiconductor device is provided that is characterized in that marking is implemented with two-dimensional code patterns for information management as framed ID information on lead frames to which semiconductor chips are bonded. It is to be noted that in the frame ID information in the two-dimensional code pattern, chip positional information indicating the position of chips within the frame and the chip ID information may be included.

Please amend the paragraph on page 8 spanning lines 20-22 to read as follows:

FIG. 1 illustrates a schematic structure of an embodiment of a two-dimensional code pattern that may be adopted in the present invention;

Please amend the paragraph on page 8 spanning lines 25-27 to read as follows:

FIG. 3 illustrates an embodiment of a two-dimensional code pattern formed on a semiconductor chip according to the present invention;

Please amend the paragraph on page 8 spanning lines 28-31 to read as follows:

FIG. 4 illustrates an embodiment of the liquid crystal mask employed to project and expose a two-dimensional code pattern on a semiconductor chip according to the present invention;

Please amend the paragraph on page 9 spanning lines 16-20 to read as follows:

FIG. 10 is a block diagram illustrating the schematic structure of a die bonder that is capable of adding a two-dimensional code pattern to a lead time during the bonding step according to the present invention;

Please amend the paragraph on page 10 spanning lines 7-9 to read as follows:

FIG. 17 illustrates a state in which character information and a two-dimensional [matrix] code pattern are printed at the package;

Please amend the paragraph on page 10 spanning line 33 to page 11 line 17 to read as follows:

First, in FIG. 1, an example of a two-dimensional code pattern and in particular a two-dimensional barcode pattern which may be employed in an embodiment of the present invention is shown. As shown in the figure, a two-dimensional barcode code pattern 10 is a two-dimensional pattern in which specific information can be recorded by coloring the squares 11 of a grid in black or white to form blocks that extends two-dimensionally in conformance to predetermined rules. It is to be noted that while the encoding rules for coloring the grid black and white in the two-dimensional pattern may be the same as those in the prior art, new encoding rules may be created instead. A detailed explanation of the actual method for coloring the grid black and white is omitted since it does not bear direct relevance to the contents of the present invention. However, since data error detection can be encoded as part of the encoding rules, and in that case, errors when reading two-dimensional barcode patterns recorded at individual chips, individual frames and individual resin-sealed semiconductor chips can be reduced, as detailed later.

Please amend the paragraph on page 12 spanning line 4-9 to read as follows:

In contrast, the inventor of the present invention has observed that the two-dimensional barcode pattern adopted in the present invention provides the following superior features compared to the character information patterns and one-dimensional barcode patterns in the prior art.